

## WHAT IS CLAIMED IS:

1. An isolated RNA comprising an intron RNA that is released in a cell, thereby modulating the function of a target gene, wherein the isolated RNA does not contain a combination of a splice donor site that includes 5'-GU(A/G)AGU-3' and a splice  
5 acceptor site that includes 5'-CU(A/G)A(C/U)NG-3'.
2. The isolated RNA of claim 1, wherein the isolated RNA contains a splice donor site that includes 5'-GUA(A/-)GAG(G/U)-3', a splice acceptor site that includes 5'-G(A/U/-)(U/G)(C/G)C(U/C)(G/A)CAG-3', a branch site that includes 5'-UACU(A/U)A(C/U)(-/C)-3', a poly-pyrimidine tract that includes 5'-  
10 (U(C/U))<sub>1-3</sub>(C/-)U<sub>7-12</sub>C(C/-)-3' or 5'-(UC)<sub>7-12</sub>NCUAG(G/-)-3', or a combination thereof.
3. The isolated RNA of claim 2, wherein the cell is a mammalian cell.
4. The isolated RNA of claim 2, wherein the splice donor site is 5'-AGGUAAGAGGAU-3', 5'-AGGUAAGAGU-3', 5'-AGGUAGAGU-3', or 5'-  
15 AGGUAAGU-3'.
5. The isolated RNA of claim 2, wherein the splice acceptor site is 5'-GAUAUCCUGCAGG-3', 5'-GGCUGCAGG-3', or 5'-CCACAGC-3'.
6. The isolated RNA of claim 2, wherein the branch site is 5'-UACUAAC-3' or 5'-UACUUAUC-3'.

7. An isolated RNA comprising an intron RNA that is released in a mammalian cell, thereby modulating the function of a target gene, wherein the isolated RNA does not contain a combination of a splice donor site that includes 5'-GU(A/G)AGU-3' and a splice acceptor site that includes 5'-CU(A/G)A(C/U)NG-3'.
- 5 8. An isolated RNA comprising an intron RNA that is released in a mammalian cell, thereby modulating the function of a target gene, wherein the isolated RNA contains a splice donor site that includes 5'-GUA(A/-)GAG(G/U)-3', a splice acceptor site that includes 5'-G(A/U/-)(U/G)(C/G)C(U/C)(G/A)CAG-3', a branch site that includes 5'-UACU(A/U)A(C/U)(-/C)-3', a poly-pyrimidine tract that includes 5'-  
10 (U(C/U))<sub>1-3</sub>(C/-)U<sub>7-12</sub>C(C/-)-3' or 5'-(UC)<sub>7-12</sub>NCUAG(G/-)-3', or a combination thereof.
9. A DNA template for the isolated RNA of claim 1.
10. An expression vector comprising the DNA of claim 9.
11. A cultivated cell comprising the isolated RNA of claim 1.
- 15 12. A cultivated cell comprising the DNA of claim 9.
13. An animal comprising the isolated RNA of claim 1.
14. The animal of claim 13, wherein the animal is a mammal.
15. The animal of claim 14, wherein the animal is a mouse.
16. An animal comprising the DNA of claim 9.

17. The animal of claim 16, wherein the animal is a mammal.
18. The animal of claim 17, wherein the animal is a mouse.
19. A composition comprising the isolated RNA of claim 1.
20. A composition comprising the DNA of claim 9.
- 5 21. A method of producing an intron RNA, comprising cultivating the cell of claim 11 to allow release of the intron RNA.
22. A method of producing an intron RNA, comprising cultivating the cell of claim 12 to allow expression and release of the intron RNA.
23. A method of modulating the function of a target gene in a cell, comprising  
10 introducing into a cell an effective amount of the isolated RNA of claim 1, wherein the intron RNA is released in the cell, thereby modulating the function of a target gene.
24. A method of modulating the function of a target gene in a cell, comprising  
15 introducing into a cell an effective amount of the DNA of claim 9, wherein the intron RNA is expressed and released in the cell, thereby modulating the function of a target gene.
25. A composition comprising a chemokine and an isolated RNA, wherein the isolated RNA has an intron RNA that is released in a cell, thereby modulating the function of a target gene, and the isolated RNA does not contain a combination of a splice

donor site that includes 5'-GU(A/G)AGU-3' and a splice acceptor site that includes 5'-CU(A/G)A(C/U)NG-3'.

26. The composition of claim 25, wherein the cell is a mammalian cell.

27. The composition of claim 26, wherein the chemokine is interleukin-2.

5 28. The composition of claim 25, wherein the cell is infected by a virus.

29. The composition of claim 28, wherein the cell is infected by HIV-1.

30. The composition of claim 29, wherein the chemokine is interleukin-2 and the intron RNA modulates the function of an HIV-1 genomic sequence.

31. A method of modulating the function of a target gene in a cell, comprising  
10 administering into a cell an effective amount of the composition of claim 25.

32. A composition comprising a chemokine and a DNA template for an isolated RNA, wherein the isolated RNA has an intron RNA that is released in a cell, thereby modulating the function of a target gene, and the isolated RNA does not contain a combination of a splice donor site that includes 5'-GU(A/G)AGU-3' and a splice  
15 acceptor site that includes 5'-CU(A/G)A(C/U)NG-3'.

33. The composition of claim 32, wherein the cell is a mammalian cell.

34. The composition of claim 33, wherein the chemokine is interleukin-2.

35. The composition of claim 32, wherein the cell is infected by a virus.

36. The composition of claim 35, wherein the cell is infected by HIV-1.
37. The composition of claim 36, wherein the chemokine is interleukin-2 and the intron RNA modulates the function of an HIV-1 genomic sequence.
38. A method of modulating the function of a target gene in a cell, comprising  
5 administering into a cell an effective amount of the composition of claim 32.
39. A composition comprising one or more agents that induce RNA-mediated modulation of the functions of two or more target genes in a cell.
40. The composition of claim 39, wherein the cell is a mammalian cell.
41. The composition of claim 39, wherein the cell is infected by a virus.
- 10 42. The composition of claim 41, wherein the cell is infected by HIV-1.
43. The composition of claim 42, wherein the target genes are selected from the group consisting of HIV-1 genes and cellular genes.
44. The composition of claim 43, wherein the cellular genes include Naf1 $\beta$ , Nb2HP, and Tax1BP.
- 15 45. The composition of claim 44, wherein the one or more agents include one or more DNA-RNA hybrids.
46. The composition of claim 44, wherein the one or more agents include one or more exogenous intron RNAs.

47. A composition comprising one or more agents that induce RNA-mediated modulation of the functions of two or more target genes in a mammalian cell.
48. A composition comprising one or more agents that induce RNA-mediated modulation of the functions of two or more target genes in a cell, wherein the one or  
5 more agents include one or more DNA-RNA hybrids.
49. A composition comprising one or more agents that induce RNA-mediated modulation of the functions of two or more target genes in a cell, wherein the one or more agents include one or more exogenous intron RNAs.
50. A method of modulating the functions of genes in a cell, comprising administering  
10 into a cell an effective amount of the composition of claim 39.
51. The method of claim 50, wherein the cell is a mammalian cell.
52. The method of claim 50, wherein the cell is infected by a virus.
53. The method of claim 52, wherein the cell is infected by HIV-1.
54. The method of claim 53, wherein the target genes are selected from the group  
15 consisting of HIV-1 genes and cellular genes.
55. The method of claim 54, wherein the cellular genes include Naf1 $\beta$ , Nb2HP, and Tax1BP.
56. The method of claim 55, wherein the one or more agents include one or more DNA-RNA hybrids.

57. The method of claim 55, wherein the one or more agents include one or more exogenous intron RNAs.